Section 1 –
Overview of Updated
Priority Chemical Trends Report
(1999-2003)

Introduction

In 2002, the EPA's Office of Solid Waste (OSW) implemented the Resource Conservation Challenge (RCC), a program designed to reduce the use of raw materials, reuse materials to make new products or generate energy, and reduce the generation of wastes. When it is economically feasible, the RCC's goals are to reduce what comes into the waste management cycle, using pollution prevention, waste minimization, source reduction, and manufacturing process and/or product design changes.

The Office of Solid Waste has identified 31 chemicals on which to focus its efforts to reduce these chemicals in wastes (Exhibit 1.1). As part of the RCC, an endeavor, referred to as the National Program for Environmental Priorities (NPEP) program, was launched to reduce the presence of these 31 chemicals in wastes. These 31 chemicals, referred to as the Priority Chemicals (PCs), consist of 28 organics and 3 metals/metal compounds that are frequently found in releases to water, air, and land. These chemicals are persistent in the environment, bioaccumulative in the food chain, and are toxic to human health in relatively small quantities. These chemicals are present in soil, sediment, ground water, surface water, air, and/or biota, with many serving as the basis for a waste being classified as hazardous. Further, they are currently being generated (either intentionally or as a by-product or impurity) and continue to be released to the environment potentially exacerbating existing problems and creating new ones. Many of these organics also pose remediation difficulties once they get into the environment resulting in costly cleanup efforts. The three metals/metal compounds were selected because they occur frequently in RCRA waste streams and to be consistent with international efforts to which the United States has commitments.

The PCs are frequently found in wastes (hazardous and non-hazardous) and present likely opportunities for PC reductions in the manufacturing, commercial, and government operations that generate these wastes. EPA encourages all generators to reduce the quantity of waste they generate. However, we believe that reducing the generation of hazardous wastes containing any of these 31 PCs should be the first priority. This reduction preferably should be achieved by reducing the use of these chemicals at the source, whenever possible. When reduction at the source is not possible, environmentally sound recycling practices should be used.

The NPEP program is the RCC's most direct tool for "beyond compliance" management of the targeted PCs and forms a significant foundation upon which EPA will build its chemicals reduction and management plan. EPA recruits partners to NPEP who pledge reductions of targeted chemicals through source reduction and/or increased recycling efforts and then sets target deadlines to achieve those reductions. The NPEP program endeavors to encourage government agencies, businesses, and manufacturers to voluntarily enroll in a partnership with EPA to find ways to minimize use of the PCs through source reduction and recycling.

This PCs Trends Report is used primarily to:

- Evaluate the progress made in achieving EPA's GPRA national goal of a 10 percent reduction of PCs in wastes by 2008, compared to the 2001 quantities (see Section 2) and
- Provide information and trends regarding the generation and management of PC quantities (aggregated and non-aggregated) contained in hazardous wastes (Subtitle C) and non-hazardous industrial wastes (Subtitle D) for the nation, EPA Regions, States, industry sectors, and Federal facilities to assist in identifying potential waste minimization opportunities to reduce these chemicals (see Sections 3, 4, and 5).

EPA uses the Trends Report as a tool for identifying opportunities to reduce these PCs in concert with the objectives of the RCC, including assisting EPA in identifying potential partners to voluntarily participate in the NPEP program. The data and trends analyses developed for this report will serve as a valuable tool in support of this program and assist in our effort to better understand trends in the

generation and management of the PCs, assess chemical reduction priorities, and identify opportunities for eliminating or reducing the PCs.

What does this Report Cover and how is it Organized?

Of the 31 chemicals identified by EPA as PCs, 24 chemicals are reported to the Toxics Release Inventory (TRI), required under EPCRA § 313. However, since EPA monitors the management of Polychlorinated Biphenyls (PCBs) under a separate initiative, only 23 of the TRI-reportable chemicals are tracked for the purposes of this Trends Report, including ~~of~~ measuring progress toward our GPRA goal (Exhibit 1.1). The remaining 7 PCs, not reported to TRI, are not currently tracked.

In Section 2 of this report, we evaluate the progress made toward achieving OSW's national GPRA goal of a 10 percent reduction of 23 PCs in waste by 2008, compared to the baseline quantity in 2001. In addition, this report includes a final update concerning the progress made in achieving the original goal of a 50 percent reduction of 17 of the PCs, compared to a 1991 baseline year.

Aside from showing progress made toward reducing the quantities of the PCs, per strategic goals, we also monitor waste generation and management trends for the PCs – to identify potential opportunities in PC reductions. As such, this Trends report presents updated analyses of the generation and management of the 23 PCs contained in wastes for the most recent 5 years of TRI data (1999 to 2003) under sections 3, 4, & 5.

Section 3 provides an overview of the national, EPA Region, State, and industry sector aggregated quantities of 23 PCs, for which data is reported to TRI for the 1999 through 2003 TRI reporting years. We focus on these five most current years of TRI data to facilitate the identification of viable potential opportunities for reducing or eliminating PCs. The data presented in this section was derived using the 2008 GPRA methodology (see discussion in Section 2 and Appendix C) and focuses on trends for the PCs, as a whole.

Section 4 of this Trends Report presents national, EPA Region, state, and industry sector (SIC code) trends for each of the 23 PC reported to TRI. Basic information regarding the PC, including its CAS number, alternative names, general uses, and potential hazards also is presented.

Section 5 of this Trends Report analyzes Federal Facilities at the national, EPA Region, state, and industry sector levels. Categorization by Federal Agency also is included.

Several appendices also are included:

- Appendix A provides a list of the states within each EPA region.
- Appendix B shows a list of the Standard Industry Classification (SIC) codes.
- The methodologies (original and revised) developed to calculate PC quantities are provided in Appendix C.
- Tables with detailed data (too extensive for inclusion in the main text), concerning trends, are included in Appendix D.
- The Index of exhibits, under Appendix E, provides a reference guide to the reader.

Exhibit 1. 1. List of the Priority Chemicals

Priority Chemicals	
Priority Chemicals Reported to TRI (Used in Methodology)	
1,2,4 - Trichlorobenzene	Lindane
2,4,5 - Trichlorophenol	Mercury and Mercury Compounds
Anthracene	Methoxychlor
Benzo(g,h,i)perylene	Naphthalene
Cadmium and Cadmium Compounds	Pendimethalin
Dibenzofuran	Pentachlorobenzene
Dioxins and Dioxin-like compounds	Pentachlorophenol
Heptachlor	Phenanthrene
Hexachloro-1, 3-butadiene	*Polychlorinated biphenyls (PCBs)
Hexachlorobenzene	Polycyclic Aromatic Compounds (PACs)
Hexachloroethane	Quintozene
Lead and Lead Compounds	Trifluralin
Priority Chemicals Not Reported to TRI (Not Used in Methodology)	
1,2,4,5-Tetrachlorobenzene	Endosulfan, alpha, beta-
4-Bromophenyl phenyl ether	Fluorene
Acenaphthene	Heptachlor epoxide
Acenaphthylene	Pyrene
For the purposes of developing this list of 31 chemicals, endosulfan alpha and endosulfan beta were counted together and Heptachlor and Heptachlor epoxide were counted together. Also, each of the three metals (lead, cadmium, and mercury) is combined with its associated metal compounds and addressed as a single Priority Chemical in this report. For example, Lead and Lead Compounds are addressed as a single Priority Chemical. Only the weight of the metal portion of metal compounds is reported to TRI. *Polychlorinated biphenyls (PCBs) are on the list of PCs and are reported to TRI but this chemical is not included in this Trends report because EPA monitors the management of PCBs under a separate initiative.	

What is the Source of the Data Used in this Report?

For this report, we use the TRI data as the source of information to analyze and identify trends regarding the extent to which PC quantities have increased or decreased over time, the EPA Regions and States where each of these PCs are generated, and the industry sectors that generate/manage these chemicals. The TRI is a publicly available EPA database that contains information on more than 650 toxic chemicals that are being used, manufactured, treated, transported, released into the environment, or recycled. This information is reported annually and reviewed and updated, on an on-going basis, to reflect corrections made to reported data.[1]

The TRI covers a wide variety of industry sectors, including those in manufacturing (i.e., Standard Industrial Classification (SIC) codes 20 through 39). These industry sectors account for more than 90 percent of the hazardous waste generated in the U.S.[2,3] Facilities in the Manufacturing sectors (SIC

[1] Data for each year are published within approximately 18 months following the end of the reporting year. For example, data for reporting year 2003 (deadline for reporting to TRI was July 1, 2004) were published May 11, 2005.

[2] Studies conducted in the early 1990s to determine whether TRI quantities were representative of RCRA waste concluded that the TRI covers a large portion of the hazardous waste generated in the U.S. For additional information on these studies and their findings, refer to Bhatnagar, S., and B.C. Murray; *Efforts to Link the Biennial Reporting System (BRS) and the Toxics Release Inventory (TRI)* (prepared for EPA's Office of Solid Waste); 1997.

[3] A study conducted in 1995 found that more than 93 percent of hazardous waste was generated at facilities also covered under the TRI. For additional information on this study, refer to INFORM, Inc.; *Toxics Watch 1995*; 1995.

codes 20 through 39) have been required to report to the TRI since its inception. Beginning with reporting year 1994, Federal facilities also have been required to report to the TRI. A further expansion of the TRI reporting sectors occurred in 1998 when the following seven sectors were added - Metal Mining (SIC code 10, except 1011, 1081, and 1094), Coal Mining (SIC code 12, except 1241), Electrical Utilities that Combust Coal (SIC codes 4911, 4931, and 4939), RCRA Subtitle C Hazardous Waste Treatment and Disposal Facilities (SIC code 4953), Chemical Wholesalers (SIC code 5169), Petroleum Terminals and Bulk Stations (SIC code 5171), and Solvent Recovery Services (SIC code 7389). It should be noted facilities in additional industry sectors also report to TRI even though they are not necessarily required to do so. The database developed for use in this Trends Report includes all facilities, regardless of SIC code (except as noted in the methodology (see Appendix C), that reported a PC quantity to TRI for reporting years 1998-2003.

What Measurement Methodology was used for this Report?

Generators report information to the TRI on a chemical-specific basis, rather than by hazardous waste stream. Although data reported to TRI includes quantities of chemicals that are contained in the waste, it does not necessarily provide a distinction between hazardous and non-hazardous industrial waste. OSW developed a measurement methodology[4] (see Appendix C) to extract the applicable data from the TRI database to calculate PC quantities and estimate what portion of the chemical quantity reported to TRI is likely to be found in hazardous waste versus non-hazardous industrial wastes.

With the declaration of a new GPRA goal by which to reduce the presence of PCs in waste, we revised the original methodology that had been used to calculate PC quantities for the 2005 GPRA goal. The revised methodology differs from the original methodology in that it addresses:

- An expanded number of PCs; 23 versus 17 PCs;
- Both hazardous and non-hazardous industrial wastes;
- Additional industry sectors (that began reporting to TRI in 1998);
- Additional reporting facilities and increased quantities of PCs resulting from lowered TRI reporting thresholds that became effective in 2000 and 2001; and
- Bevill-exempt wastes that we believe currently pose minimal opportunities for waste minimization of the PCs.

Except for the discussion in Section 2 that provides an update on the progress made toward reducing PCs in hazardous waste per the original 2005 GPRA goal, the data used in this Trends report – pertaining to the 2008 GPRA goal and all other trends analyses – were derived using the revised measurement methodology.

How EPA Assures the Quality of the Data Used in this Trends Report

It is important to ensure that the TRI data used in the measurement methodology is accurate. Otherwise, errors in the data could lead to incorrect interpretation of trends. Primary responsibility for quality of the TRI data rests with the Office of Environmental Information (OEI). We primarily rely on the OEI data quality checks and the ever-improving TRI-ME reporting software to minimize mistakes in the TRI data used for the Priority Chemicals database. The TRI Program takes several steps to ensure the quality of their data, including examining a sample of individual reports for potential errors. However, undetected reporting errors may still occur.

For the subset of TRI data that the Office of Solid Waste uses to develop the Priority Chemicals database, it is sometimes necessary to supplement the OEI data quality checks – to ensure that there are

[4] Please note that the methodology used in developing this Trends Report may differ from the methodology used by the TRI program to show trends for the EPCRA section 313 chemicals in the annual TRI Public Data Release.

no significant discrepancies in the more limited universe of facilities associated with the Priority Chemicals – discrepancies that may not necessarily have been included in the broader OEI data quality checks but that could potentially skew the trends and analyses for the Priority Chemicals. The purpose of these supplemental data quality checks is to identify those changes in the quantity of a priority chemical reported to TRI, over two consecutive reporting years, which are of sufficient magnitude to potentially have a significant affect on the trends analysis for that priority chemical. To the extent feasible, time and resources permitting, these data checks are employed to further identify significant changes for possible follow-up verification of the Priority Chemical quantities reported by a given facility. These errors may not always be very noticeable in aggregated quantities at national, state, or even industry sector-level analyses, but they can have a major effect when looking at trends at the facility level, especially for those chemicals reported by only a small number of facilities or by a relatively few number of facilities that account for a large portion of the total quantity of the Priority Chemical. Once we complete the supplemental data checks and incorporate any changes to the database, we "freeze" the database and proceed to develop the Microsoft Access tables and queries needed to analyze the Priority Chemicals trends. Once the database is frozen, it is not modified to incorporate any TRI reporting errors subsequently identified. We depend on the Office of Environmental Information to include them in the next year's TRI dataset. Of course, these reporting errors will only be reflected in the new TRI dataset if the reporting facility had submitted a revised TRI Form R to EPA.

Additional details concerning the steps taken in this process are provided in Appendix C.

Seven of the PCs are not reported to TRI (Exhibit 1.1). Currently, we do not have a readily available means by which to track the generation and management of these 7 PCs. EPA is considering further development of a methodology that would extract information from the RCRA Hazardous Waste Biennial Report (BR) data for use in analyzing trends regarding the generation and management of these 7 PCs. A description of each of these 7 PCs and their uses is provided at the end of Section 4.

Progress and What May Change in Next Year's Report?

In this Trends Report we discuss progress made toward both goals. We used a different measurement methodology for each goal. These methodologies include differences such as the number of PCs addressed, industry sectors included, and changes in TRI reporting thresholds for a certain number of the chemicals. The current goal includes all 23 of the PCs reported to TRI; the previous goal only included the 17 PCs that were reported to TRI in 1991. As such, it is not suitable to make comparisons between the quantities for each of these goals.

We also included graphics that assist the reader in visually interpreting the data. Maps of facilities illustrate the distribution of PC quantities reported. Trends in specific PC quantities reported between 1999 and 2003 are graphed over their respective states.

In addition to these new items, OSW plans to include more analyses in next year's report. Such items may include the transition from SIC (Standard Industrial Classification) to NAICS (North American Industrial Classification System) codes, Geographical Information Systems (GIS) analyses, and Biennial Report System (BRS) data. OSW may also focus efforts on analyzing the reasons behind the trends, as well as including a section on Mercury and Mercury Compounds as a particularly high agency priority.